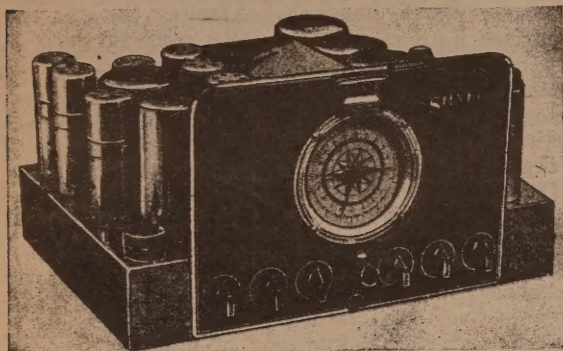


THE HORN SPEAKER

The first
and the
standard
monthly
publication
for radio
collectors
since 1972

The Classic Radio

SHORT WAVE CRAFT for NOVEMBER, 1935



The "ship-shape" commercial appearance of this ultra modern 10 tube, 1200 to 33,000 kc. super-het, plus every new feature, makes it ideal for amateur or short-wave "DXer." (No. 319)

SILVER Receiver for "Hams" or "Fans"

By McMurdo Silver

● OF all the receivers available to the serious amateur or short-wave B. C. L., (broadcast listener) superheterodynes predominate today due to their high selectivity, especially with crystal filter, and their ease and dependability of operation. They are, however, mostly all alike in that they use but one R.F. stage if any, and the usual and typical crystal filters in a conventional one or two stage I.F. amplifier. The past year has taught that more can be, and is, desired, as evidenced by the increasing appreciation of the image selectivity and noise elimination benefits of not one, but of two R.F. stages, of a quiet low gain I.F. amplifier and stable air-tuned and temperature-isolated circuits throughout.

The receiver illustrated herewith satisfies these latter day requirements and is described in this article—an amateur, not a "revamped" broadcast receiver, designed by amateurs for amateurs and to fit amateur pocketbooks, and usually to fit an amateur junk box assortment of standard

Crystal Filter: Of course, but one that makes the usual garden variety look sick by comparison. As much, and usually more sock in series circuit as when cut out, and in parallel, the ability to drop an unwanted heterodyne completely out without impairing phone signal quality.

Band-Spread: One tuning dial, accurately calibrated (yes, the builder can so align it without any extra test equipment) with geared, no slip, band-spread pointer on 200 division, 360 degree inside scale which accurately and positively relogs. Fast and slow tuning ratios, 23:1 and 130:1 spread, 1000 degrees on 160 meters, 700 degrees on 80 meters, 400 on 40, 120 on 20, and 200 degrees on 10 meters. Effective feet, not inches, of dial space on the amateur and short wave broadcast bands, since 360 degrees of band spread equals about one foot of dial space and five full turns of slow knob for 360 degree band spread pointer rotation.

A.V.C. (automatic volume control) of course, but amplified so it really does a job on weak signals, and speeded up so it does likewise on C.W. A switch cuts A.V.C. out for C.W., and in for phone if so preferred.

Controls: Enough and no more. Not usual blind knobs, but every one labeled as to what it does, and calibrated so you can tell that QSO just how much better he comes in tonight than he did with the old rig last night.

R-Meter: A sensitivity meter that lets you actually measure signals as weak as 5.0 microvolts absolute—and that's not an R9 signal, its about R2-R3.

Construction: Finish is polished chromium, like the finest custom-built jobs.

Alignment: The sensitivity meter is the output meter in aligning, the crystal in a temporary circuit using no extra parts except that odd '99 or 30 tube, its socket and a couple of flashlight batteries does the I.F. job, while signals do the whole R.F. job. Hammarlund's air trimmers make all this a pleasure, not the usual uncertain and God-knows-when headache.

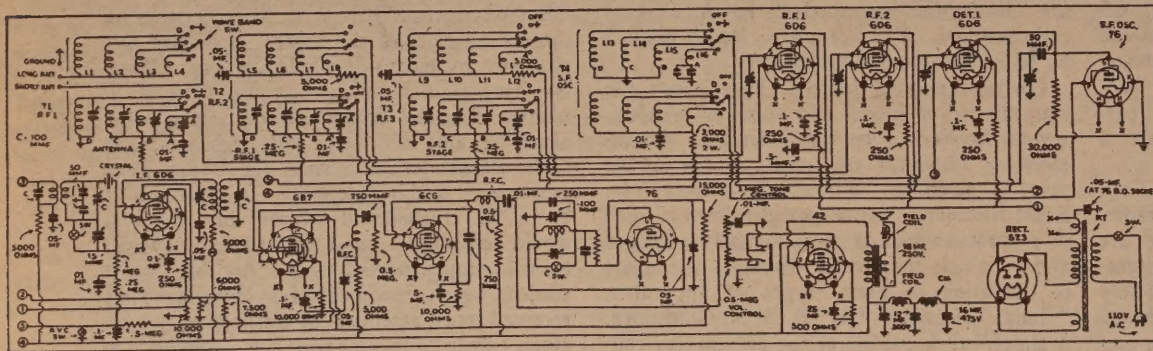
In the photo, the knobs left to right are crystal phasing and parallel switch, beat oscillator pitch—on-off switch, audio volume control, A.V.C. on-off switch, five position (one dead for "send") wave change switch, tone control and sensitivity or manual volume control. The dial is shown 0-100—actually its outside carries four calibrated bands, and the inside 0-200 division, full circle band spread pointer scale.

Speaker new Jensen C8X, 8" (a matched 12" speaker can be had if preferred).

Band Change: Individual coils for each band, picked up by dependable Yaxley eight-gang wave change switch just like you find in all good broadcast receivers.

Frequency Stability: Individually shielded coils, all circuits Hammarlund air dielectric, not compression mica, tuned and trimmed, plenty of ventilation, and temperature isolation make for the ability to stay "zero beat" on a good 20 meter signals for hours.

I.F. Amplifier: Set at 25 microvolts absolute sensitivity to place the limit of inherent noise at thermal agitation in the antenna circuit where it belongs, not as usual at the first detector so as to lose weak signals in set noise. Two Aladdin



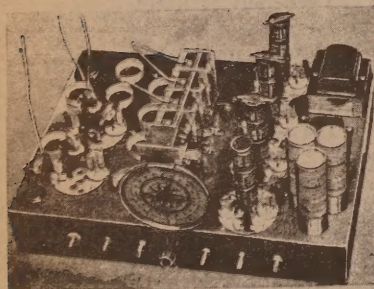
Wiring diagram for the new "Silver" super-het for short and broadcast waves.

parts. If it satisfies, as it does, serious amateur ("Ham") needs, it is automatically an excellent short-wave broadcast receiver, which it also is.

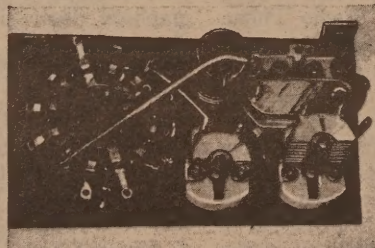
For the engineer its performance is easily described by saying that its four low-C 200 mmf. tuning bands cover 1700 to 33,000 kc., which includes the 160, 80, 40, 20 and 10 meter amateur and all short-wave broadcast bands, its sensitivity is below a microvolt all over this range, its inherent noise never exceeds 10 milliwatts at maximum sensitivity, its selectivity is variable from 150 cycles 10,000 times down to 10 kc., its fidelity is controllable from flat to 4 db. from 30 to 4000 cycles, to peaked audio for C.W. reception, its undistorted power output 3.0 watts, rising to a maximum of about 4.0 watts.

While considering the really ideal performance described above, let's take a look at its other features as briefly as possible.

Circuit: Superheterodyne, with two 6D6 tuned r.f. stages on all four bands, suppressor grid injected 6D6 s.g. first detector, 76 electron coupled H.F. oscillator, one 6D6 i.f. stage, high gain 6C6 tetrode second detector, 6B7 amplified A.V.C., optimum inductively coupled variable-pitch 76 beat oscillator, 42 output pentode and 523 rectifier.



Another view of the Silver Super-het.



Typical wave change switch section and "D" band (16 to 32 mc.) inductance of the section 5D. The oscillator section is shown with the two low-frequency oscillator padding condensers, only needed for the full-wave coils.

Polyiron 465 kc. I.F. transformers, air tuned, and variable as to selectivity to suit your taste. Crystal I.F. transformer dual tuned.

Sensitivity: Variable so you can adjust it with two knobs from 50 cycles wide to 10 kc.—or a socket wrench pushed through two I.F. can holes lets you vary the I.F. transformer coupling and selectivity even further.

Here is the complete parts list—all standard high quality parts of dependable makers. You can build this receiver, building as you buy, building all at once, or you can buy it as a laboratory built and tested R.C.A. licensed complete receiver. Substitution is not recommended—high frequency receiver specifications simply must not be played with, for even resistors, let alone tubes and other parts, are critical, and other equally good parts will usually vary enough to upset performance seriously.

Model 5D Silver Parts List

Alladin Radio Industries, Inc.
2—465 kc. Polyiron Core and Coil Assemblies
Chicago Transformer Company

- 1—2067 Power Transformer 110 MA, 325 V. Sec.
- 1—286D Filter Choke
- Cross Name Plate & Mfg. Company
- 1—4 1/2" Two-Speed Band Spread Airplane Dial with "Radio-Silver" calibrated scale
- 1—"Radio-Silver" Control Panel
- Hammarlund Manufacturing Co.
- 16—APC25 Air Trimmers—Type D, 25 mmf.
- 5—APC100 Air Trimmers—Type D, 100 mmf.
- 1—MCS1000 Trimmer 1000 mmf.
- 2—SM15 Star Midgets—15 mmf.
- Continental Carbon Company
- 4—250 ohm, 1/2-watt Resistor
- 1—500 ohm, 1-watt Resistor
- 1—6000 ohm, 1-watt Resistor
- 2—10,000 ohm, 1/2-watt Resistor
- 1—3000 ohm, 2-watt Resistor
- 1—30,000 ohm, 1-watt Resistor
- 5—5000 ohm, 1/2-watt Resistor
- 2—15,000 ohm, 1/2-watt Resistor
- 4—250,000 ohm, 1/2-watt Resistor
- 3—600,000 ohm, 1/2-watt Resistor
- Ohmite Manufacturing Company
- 1—7500 ohm "Brown Devil" 10-watt Resistor
- Readrite Meter Works
- 1—TM105, 0-7 MA Meter, arrow left, window down
- 6—1 1/4" Black Bar Pointers
- McMurdo Silver Corporation
- 1—4 Gang 200 mmf. "Low Min." Condenser
- 1—Kit of 4 A-B-C Coils (2 R.F., 1st Det. and

- Osc.) 4 D Coils, (2 R.F. 1st Det. and Osc.)
- 1—17F R.O. Coil
- 1—17G Crystal Auto. Transformer and Shield
- 6—Shield Cans
- 2—10 mh. R.F. Chokes
- 8—Tube Shields
- 1—A-A-G Binding Post Strip
- 1—Set 12 Am. Phenolic High-Q Sockets with eight tube shield bases (4-6D6, 1-6C6, 1-42, 1-6B7, 1-5Z3, 2-76, 2 5-pin blank)
- 1—AC Cord and Plug
- 1—AVC On-Off Switch
- 1—Kit of Hardware
- Sprague Products Company
- 1—475V, 16 mf. Wet Condenser
- 1—250V, 18 mf. Self-Regulating Electrolytic Condenser
- 1—300V, 12 mf. Self-Regulating Electrolytic Condenser
- 7—TC15 .05 mf. 600-volt Condensers
- 1—TCS 1/2 mf. 600-volt Condensers
- 7—TC11 .01 mf. 600 volt Condensers
- 1—HCS 5 mf. 25 volt Dry Electrolytic Condenser
- 5—TC1 .1 mf. 600 volt Condensers
- Steel Box and Display Company
- 1—Radio-Silver polished chromium Pierced Chassis, Gang Condenser Shield, 4 Partitions and bottom shield
- Yaxley Division, P. R. Mallory Company
- 1—N 500,000 ohm Volume Control

- 1—0.1 megohm Tone Control
- 1—G 10,000 ohm Sensitivity Control
- 1—704A Junior Jack (4 spring, single closed circuit and single filament circuit)
- 1—SP07488 Locating Plate, 5 position, 9" flat shaft
- 5—SP07488 2 Circuit, 5 position Plates
- 8—SP07488 1/4" Spacers
- 1—No. 9 Switch
- Pilermatic Manufacturing Corporation
- 3—50 mmf. Isolantite-Mica Fixed Condensers
- 5—250 mmf. Isolantite-Mica Fixed Condensers
- 1—.004 mf. Isolantite-Mica Fixed Condensers

List of Accessories

- Billie Piezo Electric Company
1—465 kc. Type B C Mounted Crystal
Raytheon Production Company
4—6D6 Tubes
1—6C6 Tube
1—6B7 Tube
1—76 Tube
1—41 Tube
1—42 Tube
1—5Z3 Tube
Jensen Radio Manufacturing Company
1—C8X Speaker with 700-ohm Transformer, field 495 ohms, 110 M A

Books About Radio

By John V. L. Hogan

Consulting Engineer, New York; Past President, Institute of Radio Engineers

ONE of the constantly recurring and seldom answered questions of the day is "What is a good book on radio?" There are several reasons why it is not easy to reply to this query; chief among them is that radio signaling is already so huge a topic that no one book can cover it accurately and completely. Again, the written treatment which one person requires will be utterly unsuited to the needs of other readers; there must be provided both the detailed technical descriptions of single branches of the art to suit the demands of engineer-students, and the simplified (sometimes obviously sugar-coated) expositions intended for beginners. Between these extremes one finds a host of radio publications, some good and many unutterably bad, each attempting to cater to some group of persons interested in radio either as an art, a science, a service, or an amusement.

There lie before me as I write (to quote Captain Fitzurse) more than eighty books on radio. Some of these are old standbys; some are worthy newcomers into the field of radio literature; and some are apparently written solely because their authors or their publishers thought that there was a good market for any book with "radio" or "wireless" in its title. It will not be possible for me to review all of these in the space of this article, nor even to describe all the good ones. However, I can perhaps select a number which can be depended upon in the main and which will appeal to each of the groups which wants to read about radio.

Let us take up first those intended for the beginner, who has possibly been attracted by the broadcast services and who desires to learn something about radio in general. Readable and clear presentations of radio principles and their earlier applications will be found in Professor Kennelly's, "Wireless Telegraphy and Telephony"¹ and Professor Fleming's "The Wonders of Wireless Telegraphy"²; although both were printed a decade ago, their interest and accuracy make them valuable to-

day. Another well prepared book of the same period is "Wireless Telegraphy"³ by Professor C. L. Fortescue. A more recently revised book is "Wireless Telegraphy and Telephony"⁴ by Alfred P. Morgan; this volume is neither so closely confined to radio principles nor so exhaustive in its explanations of them as those above mentioned, and it takes space to describe many obsolete instruments, but it aids in giving a newcomer something of a general view of the radio field. Recent books which treat the uses of radio in a broad way, outlining for the reader a picture of the applications beyond radiophone broadcasting, are "Radio for Everybody"⁵ by A. C. Les-carbours and "The Complete Radio Book"⁶ by R. F. Yates and L. G. Pacent.

For readers who desire to learn about the transmission of speech and music by wireless, several books can be recommended. An interesting historical treatment of the earlier years is given in "Wireless Telephony"⁷ by Ernst Ruhmer. This is brought down to 1918 in a volume which is more logically arranged and in which the author discusses the mode of operation of many types of apparatus. "Radio Telephony"⁸ by Dr. A. N. Goldsmith. A simplified discussion of the present-day radiophone, with emphasis on the vacuum tube but little historical matter, is contained in "Elements of Radio Telephony"⁹, by W. C. Ballard, Jr. One of the newest books, which gives an exceedingly clear presentation of radiotelephonic principles and authoritative descriptions of the operation of modern sending and receiving apparatus, is "Radio Phone Receiving,"¹⁰ edited by Dr. Erich Hausmann and written jointly by a number of well-known radio engineers.

Another extensive group of radio readers includes those who want information on how to make their own instruments. There have been many articles, pamphlets, and books printed for amateur apparatus builders, but it is a sad fact that the great majority of the designs presented are either impractical or inefficient, if not both. Many radio writers

have given explicit directions for constructing transmitters and receivers which (so far as one can judge from the almost obvious faults in the suggested instruments) they have probably never tried to build and certainly never succeeded in working. In contrast to this sort of thing are two helpful books by M. B. Sleeper, entitled "Construction of Radio Phone and Telegraph Receivers for Beginners"¹¹, and "Design Data for Radio Transmitters and Receivers"¹²; full working details for building a modern variometer type receiver (together with some interesting comments on radio telephony) will be found in "The How and Why of Radio Broadcasting"¹³ by Arthur H. Lynch; and much information of utility is given by E. E. Bucher in "The Wireless Experimenter's Manual"¹⁴.

A number of special subjects in the application of radio have been treated individually. "Radiodynamics"¹⁵ by B. F. Miessner tells an interesting story of the control of distant mechanisms by means of wireless waves; "Wireless Transmission of Photographs"¹⁶ by M. J. Martin describes many unusual experiments along the line which the title indicates; and "The Alexanderson System for Radio Telegraph and Radio Telephone Transmission"¹⁷ by E. E. Bucher will interest any one who would enjoy exploring a modern high-powered trans-oceanic wireless station. Another special subject, which on account of its importance has received much attention by authors, is the vacuum tube now in such wide use. Elementary books describing its action as detector, amplifier, and oscillator are "The Oscillation Valve"¹⁸ by R. D. Bangay, and "The ABC of Vacuum Tubes in Radio Reception"¹⁹ by E. H. Lewis, both of which are clear and generally accurate. A somewhat less recent book on the same subject, which, however, gives an easily understood graphical description of the working of the device, is Bucher's "Vacuum Tubes in Wireless Communication."²⁰ For the advanced or scientifically trained student "The Thermionic Vacuum Tube and its Applications"²¹ by H. J. Van der Bijl will be found a splendid treatise. Two other highly technical books on tubes are "The Thermionic Valve and its Developments in Radio Telegraphy and Telephony"²² by J. A. Fleming, and "Thermionic Tubes in Radio Telegraphy and Telephony"²³ by John Scott-Taggart. The former gives much historical

matter of interest and value, as well as Professor Fleming's mathematical analyses of tube action; the latter is a very recent publication which describes present day British practice in the design and construction of valve outfits.

Two other rather specialized books which will be of greatest use only to the technical student are "Telephony without Wires"²⁴ by P. R. Coursey and "Continuous Wave Wireless Telegraphy"²⁵ by W. H. Eccles. The first of these is quite different from the purely popular accounts of wireless telephony; it treats the radiotelephone technically as a division of radio signaling and assumes that the reader is fairly well familiar with wireless telegraphy. The second book is a full engineering development of the electrical theory of continuous-wave circuits and instruments, including vacuum tubes.

Having passed to the technical publications in radio, we must now consider those which go into the subject in a general but somewhat advanced way. The non-technical reader will have difficulty in getting very much from most of these books, but any one with even a small mechanical or electrical aptitude or education will be able to dig out a good deal of immense value. F. K. Vreeland's book called "Maxwell's Theory and Wireless Telegraphy"²⁶, containing a translation of the famous paper by Poincaré, is not abstruse; the presentation of the principles underlying modern radio is vivid and easily read, so that the book, though nearly twenty years old, is interesting to-day. Another of the older books which still is attractive is the "Principles of Wireless Telegraphy"²⁷ by Dr. G. W. Pierce; here the emphasis is placed upon the action of resonant circuits and receiving instruments. A somewhat later publication is Zenneck's "Wireless Telegraphy,"²⁸ translated by A. E. Seelig, which is a classical work on the fundamentals of radio design and practice. Another radio classic is Professor J. A. Fleming's "Principles of Electric Wave Telegraphy and Telephony"²⁹, which first appeared in 1906 but which has been brought up to 1919 in a revised fourth edition; this volume is an exhaustive historical, theoretical and descriptive treatment of the development of radio signaling.

In the past year or two there have appeared three other general radio books, each of which is noteworthy in its particular classification. "Electric Oscillations and Electric Waves"³⁰ by Professor G. W. Pierce is a highly technical discussion of the theories and operations underlying the whole science of radio; here engineering students well accustomed to handling the tool of mathematics will find much to clarify and reduce to quantitative relations the ideas which are generally considered only qualitatively. The second book, "Principles of Radio Communication"³¹ by Professor J. H. Morecroft, is much more understandable to the average technical man, for although mathematical analyses and developments are not slighted they are supplemented with abundant graphical illustrative data. Moreover, this volume does not stop with abstract considerations, but goes into the basic detail of modern radio instruments. It is valuable both as a course of study and as a reference book. The third of this recent group is the U. S. Army Radio Pamphlet (something of a misnomer) No. 40, named "The Principles Underlying Radio Communication" (Second Edition)³² which is intended for students with comparatively little mathematical training but who desire a quite

comprehensive presentation of electromagnetism and its applications in radio.

Although a good many of the books mentioned above contain material the most important use of which is for reference, there are certain others whose greatest value appears when one has before him some particular problem for the solution of which certain quantitative data are required. Among these are "Wireless Telegraphy and Telephony; a Handbook of Formulae, Data and Information"³³ by W. H. Eccles, "Standard Tables and Equations in Radio Telegraphy"³⁴ by Bertram Hoyle, and "The Wireless Telegraphist's Pocket Book of Notes, Formulae and Calculations"³⁵ by J. A. Fleming. The U. S. Bureau of Standards has issued as its Circular No. 74, under the title "Radio Instruments and Measurements"³⁶ a valuable collection of radio data. In this connection, special mention must be made of Ralph Batchler's "Prepared Radio Measurements"³⁷ which contains some sixty self-computing or alignment charts designed to obviate much numerical work in simple radio computations.

Another useful reference work is the "Yearbook of Wireless Telegraphy"³⁸, which comes out annually and contains the radio laws of various countries, a five-language radio glossary, a list of the land stations throughout the world, and much other information. Finally, every radio station should have the U.S. Department of Commerce radio pamphlets "Radio Communication Laws of the U. S."³⁹, "Amateur Radio Stations of the U. S."⁴⁰ and "Commercial and Government Radio Stations of the U. S."⁴¹ which contain essential data as to license requirements, the call letters and locations of important radio stations, etc.

So brief a description as I have given of each book will hardly suffice to bring out its real value to the reader. Nevertheless, by arranging the volumes in a rough classification and by mentioning only a few of the leading books in each class, I trust that I have succeeded in indicating which (of the many publications now available) are most likely to fill certain needs in a reasonably satisfactory way.

* * *

Books noted in the above article, in the order of reference to them:

- 1: "Wireless Telegraphy and Telephony"; A. E. Kennelly; Moffat, Yard & Co., New York, 1910; 279 pages; (out of print).
- 2: "The Wonders of Wireless Telegraphy"; J. A. Fleming; Society for Promoting Christian Knowledge, London, 1913; 279 pages; price \$1.40.
- 3: "Wireless Telegraphy"; C. L. Fortescue; G. P. Putnam's Sons, New York, 1913; 143 pages.
- 4: "Wireless Telegraphy and Telephony"; Alfred P. Morgan; Norman W. Henley Pub. Co., New York, 1922; 154 pages; price \$1.50.
- 5: "Radio for Everybody"; A. C. Lescarboua; Scientific American Pub. Co., New York, 1922; 334 pages; price \$1.50.
- 6: "The Complete Radio Book"; R. F. Yates and L. G. Pacent; The Century Co., New York, 1922; 330 pages; price \$2.00.
- 7: "Wireless Telegraphy"; Ernst Ruhmer; Crosby Lockwood & Son, London, 1908; 224 pages; price
- 8: "Radio Telephony"; A. N. Goldsmith; The Wireless Press, New York, 1918; 247 pages; price \$2.50.
- 9: "Elements of Radio Telephony"; W. C. Ballard, Jr.; McGraw-Hill Book Co., New York, 1922; 132 pages; price \$1.50.
- 10: "Radio Phone Receiving"; E. Hausmann, A. N. Goldsmith, L. A. Hazeltine, J. V. L. Hogan, J. H. Morecroft, F. E. Carnavacioli, R. D. Gibson, and P. C. Hoernel; D. Van Nostrand

- Co., New York, 1922; 183 pages; price \$1.50.
- 11: "Construction of Radio Phone and Telegraph Receivers for Beginners"; M. B. Sleeper; Norman W. Henley Pub. Co., New York, 1922; 142 pages; price 75 cents.
- 12: "Design Data for Radio Transmitters and Receivers"; M. B. Sleeper; Norman W. Henley Pub. Co., New York, 1922; 85 pages; price 75 cents.
- 13: "The How and Why of Radio Broadcasting"; Arthur H. Lynch; Doubleday Page & Co., New York, 1922; 32 pages and 4 charts; price 50 cents.
- 14: "The Wireless Experimenter's Manual"; E. E. Bucher; The Wireless Press, New York, 1920; 340 pages; price \$2.25.
- 15: "Radiodynamics"; B. F. Miessner; D. Van Nostrand Co., New York, 1916; 206 pages; price \$2.00.
- 16: "Wireless Transmission of Photographs"; M. J. Martin; The Wireless Press, Ltd., London, 1916; 114 pages; price \$2.00.
- 17: "The Alexanderson System"; E. E. Bucher; The Wireless Press, New York 1920; 55 pages; price \$1.25.
- 18: "The Oscillation Valve"; R. D. Bangay; The Wireless Press, Ltd., London, 1920; 215 pages; price \$2.75.
- 19: "The ABC of Vacuum Tubes"; E. H. Lewis; Norman W. Henley Pub. Co., New York, 1922; 132 pages; price \$1.00.
- 20: "Vacuum Tubes in Wireless Communication"; E. E. Bucher; The Wireless Press, New York, 1918; 174 pages; price \$2.25.
- 21: "The Thermionic Vacuum Tube"; H. J. Van der Bijl; McGraw-Hill Book Co., New York, 1920; 391 pages; price \$5.00.
- 22: "The Thermionic Valve and its Developments in Radio Telegraphy and Telephony"; J. A. Fleming; The Wireless Press, Ltd., London, 1919; 279 pages; price \$5.00.
- 23: "Thermionic Tubes in Radio Telegraphy and Telephony"; John Scott-Taggart; The Wireless Press, Ltd., London, 1921; 424 pages; price \$8.00.
- 24: "Telephony without Wires"; P. R. Coursey; The Wireless Press, Ltd., London, 1919; 414 pages; price \$5.00.
- 25: "Continuous Wave Wireless Telegraphy"; W. H. Eccles; The Wireless Press, Ltd., London, 1921; 407 pages; price \$8.00.
- 26: "Maxwell's Theory and Wireless Telegraphy"; H. Poincaré and F. K. Vreeland; McGraw Pub. Co., New York, 1904; 255 pages; (out of print).
- 27: "Principles of Wireless Telegraphy"; G. W. Pierce; McGraw-Hill Book Co., New York, 1910; 350 pages; price \$3.00.
- 28: "Wireless Telegraphy"; J. Zenneck, translated by A. E. Seelig; McGraw-Hill Book Co., New York, 1915; 442 pages; price \$5.00.
- 29: "The Principles of Electric Wave Telegraphy and Telephony"; J. A. Fleming; Longmans, Green & Co., London, 1919; 707 pages; price \$14.00.
- 30: "Electric Oscillations and Electric Waves"; G. W. Pierce; McGraw-Hill Book Co., New York, 1920; 517 pages; price \$5.00.
- 31: "Principles of Radio Communication"; J. H. Morecroft; John Wiley & Sons, New York, 1921; 935 pages; price \$7.50.
- 32: "The Principles Underlying Radio Communication"; Signal Corps, U. S. Army; Government Printing Office, Washington, 1922; 619 pages; price \$1.00.
- 33: "Wireless Telegraphy and Telephony"; W. H. Eccles; D. Van Nostrand Co., New York, 1918; 514 pages; (temporarily out of print).
- 34: "Standard Tables and Equations in Radio Telegraphy"; Bertram Hoyle; The Wireless Press, Ltd., London, 1919; 159 pages; price \$3.25.
- 35: "The Wireless Telegraphist's Pocket Book of Notes, Formulae and Calculations"; J. A. Fleming; The Wireless Press, Ltd., London, 1915; 347 pages; price \$3.50.
- 36: "Radio Instruments and Measurements"; Bureau of Standards; Government Printing Office, Washington, 1918; 329 pages; price 60 cents. Reprinted by The Wireless Press, New York, and bound in cloth; Price \$1.75.
- 37: "Prepared Radio Measurements"; Ralph Batchler; The Wireless Press, New York, 1921; 132 pages; price \$2.00.
- 38: "The Yearbook of Wireless Telegraphy and

- Telephony"; The Wireless Press, Ltd., London; issued annually; about 1200 pages; price \$6.00.
- 39: "Radio Communication Laws of the U. S."; Department of Commerce; Government Printing Office, Washington; price 15 cents.
- 40: "Amateur Radio Stations of the U. S."; Department of Commerce; Government Printing Office, Washington; price 15 cents.

41: "Commercial and Government Radio Stations of the U. S."; Department of Commerce; Government Printing Office, Washington; price 15 cents.

Note: The books published by The Wireless Press, Ltd., London, may be obtained from The Wireless Press, New York, at the prices given.

ONE COMMERCIAL SIDE OF RADIO

This early article offers a great deal of insight into the history of radio. The beginning collector is usually always fascinated by the kind of information gleaned from this article.

By PARKHURST WHITNEY

A NEW business has suddenly sprung up in the United States—the making of radio receiving sets and the parts thereof. It is of some importance that the public realize what manufacturers are in it and what are the conditions in which they are producing, and it is interesting to speculate upon the possibilities of this, in some ways, new industry.

It is using a method often employed by get-rich-quick concerns to compare a new business with successful old ones, but if the reader bears in mind that these comparisons show the maximum possibilities and not necessarily anything else, it is permissible.

There are ten million automobiles in the United States. It took twenty years to reach this figure, but in that period the making of automobiles has developed into one of the largest manufacturing businesses in the country. The average expenditure for cars and parts is about five billions a year.

There are about six million phonographs in the country. In 1914 the output of machines was 514,000, having a value of \$15,291,000; in the same year 27,221,000 records, having a value of \$11,111,000, were made. In 1919, the total output of machines was 2,226,000 valued at \$91,569,000; the total output of records was 106,997,000, valued at \$44,690,000. For purposes of comparison, however, the figures for 1919 in the phonograph industry are not normal. The output for each of the last two years has not approached those figures.

These are all businesses contributing to the commercial prosperity of the nation and to the intelligence, well-being, and enjoyment of its inhabitants.

In these matters the radio business might be like unto these others. What are its commercial possibilities? How large is it destined to be? It is theoretically possible for every family and every office to have a radio receiving set. Practically, if the radio receivers are looked upon as necessary conveniences, receivers might become nearly universal. If they are considered valuable chiefly as a means of providing amusement or educational information, they will be much less numerous.

The maximum—taking the automobile standard—would be about ten million. The lower figure—taking the phonograph standard—would be about six million. If the average investment for each receiving set were only \$50, the total investment for the lower number would be \$300,000,000. If the country should become saturated with these six

million receivers in a period of five years, that would mean \$60,000,000 of new business for each year.

These are the roughest kind of figures upon a very general hypothesis, but they serve to show the possibilities—perhaps not the probabilities, but the possibilities of this new addition to American industry. These possibilities and probabilities are admittedly guesswork, even by those whose financial interests are the greatest, and the records of the business so far are too meagre to do much except to stir the imagination.

To reach anything like these figures, both present sending and receiving apparatus needs improvement, regulation must be both wise and effective, and a skillful direction of broadcasting must be built up on a solid commercial foundation which does not now exist.

In 1919, the selling of radio telephone receiving sets to the public did not exist as a commercial business. There were more than ten thousand sending and receiving sets for radio telegraph work and there were radio telephone receivers in existence, but not in general public use. Nor was there any demand for them, for no stations were broadcasting entertainment or information to the general public.

It is quite likely that the war affected the radio telephone in two ways—hastened its mechanical development and delayed its commercial development. Experiments carried out in 1915 by the American Telephone and Telegraph Company, and subsequently, when voices at Arlington, Va., were heard in Paris, France, illustrated its possibilities in a striking way. After our entrance in the war our engineers were concerned with the military application of the radio telephone, such as communication between airplanes and the ground, the development of submarine chaser radio telephone sets and miscellaneous sets for field use. These activities resulted naturally in improvements in the apparatus, and likely enough laid some of the ground work for the present interest through the wide contact of men in service with radio telephony. Still, broadcasting to the general public was entirely undeveloped, and that was the situation during two years following the war. The Navy had, of course, used the radio telephone widely during the war, and after the war some messages were broadcasted, but the matter sent out did not start the public buying receivers. In 1915 the American Radio & Research Corporation, of Medford Hillside, Mass, did some broadcasting but not on a regular schedule.

In 1920, however, the Westinghouse Company opened a broadcasting station, at East Pittsburgh, Pa. The programmes of this station and the next one started at Newark were arranged for public consumption and the public was so advised, the station at Newark having the very effective exploitation of the Newark *Call*, the first newspaper to publish the radio section which is now becoming very common.

The East Pittsburgh station was opened November 5, 1920. In the fall of 1920, then, the public first had reason to buy radio telephone receiving sets, and it began to buy. The East Pittsburgh station of the Westinghouse Co. unquestionably began the present sensational developments. The public bought all the equipment that was for sale and from that time to this the manufacturers have never been able to catch up with the demand. The manufacturers of radio receivers and accessories are much in the situation that munition makers were when the war broke. They are suddenly confronted with a tremendous and imperative demand for apparatus. It is a matter of several months at best to arrange for the quantity production of radio receiving apparatus if the type to be manufactured were settled, but the types are no more settled than were the types of airplanes in the war. The manufacturing companies are, therefore, confronted with carrying on their experimental work, devising new types and at the same time producing the best they can in such quantity as they can, and they must do all this while building up their organizations, working out their policies, and keeping an eye on the activities of the Government so that they can keep in accord with its regulations.

Up to the present, Secretary Hoover estimates that there are 600,000 receiving outfits in the United States, including both those bought complete or nearly so and those constructed by the owners. Even if all the manufacturers' figures were available, it would be difficult to give an exact figure because so many people have bought parts and constructed their own sets. In 1922, there seems indisputable evidence that the sale will equal or exceed 1921. The first quarter of the year has seen an avalanche of ordering. Everything that could be produced has been sold.

The radio manufacturing field differs from the automobile and phonograph industries in their beginnings. The early manufacturers of automobiles and phonographs did not include great establishments already engaged in kindred work, but were chiefly concerns that began in a comparatively small way as automobile makers or phonograph manufacturers.

And the automobile and phonograph businesses grew slowly compared with the radio business. The early automobile and phonograph companies would have been even worse swamped with such a demand as now confronts the radio manufacturers than these concerns are. The reason for this is that in the radio field, besides the manufacturers chiefly engaged on radio apparatus, the big electrical companies, facilities are also available.

Among those companies depending chiefly on the radio business are such manufacturers as the American Radio & Research Corporation, of Medford Hillside, Mass; The Adams-Morgan Co., Upper Montclair, N. J.; Acme Apparatus Co., Cambridge, Mass.; Atlantic Radio Co., Inc., Boston, Mass.; Clapp-Eastman Co., Cambridge, Mass.; F. A. D. Andrea, New York; A. H. Grebe & Co. Inc., New York; Colin B. Kennedy Co., San Fran-

cisco, Cal.; Remler Radio Mfg. Co., Chicago, Ill. These concerns manufacture receiving sets. They are concerns chiefly built upon the radio business.

Then there are such concerns as the American Telephone & Telegraph Co., with its subsidiary the Western Electric Co.; the General Electric Co.; the Western Electric Company; and the Westinghouse Company—the great electrical companies of the country. As four of the largest broadcasting stations are now operated by the Westinghouse Company, and as a great many of the patents on radio receiving sets are owned by these big companies, it is well for the radio user to understand their position and influence in the field.

Ever since radio communication appeared upon the horizon, the American Telephone and Telephone Co. has continuously spent money experimenting in this field. The General Electric Company likewise spent a great deal of money to perfect apparatus which it hoped to sell to the various transoceanic radio companies. It had very valuable patents, especially on sending apparatus, prior to our entry into the war. During the war the Westinghouse Company did a good deal of work for the Signal Corps, and it likewise acquired valuable patents, the Armstrong and heterodyne patents among others. Practically all of this activity was based upon the transoceanic commercial radio business and the marine business. At this time the Marconi Company was the chief international radio company. In 1919 the General Electric Co. was about to sell its great Alexanderson transmitters to the Marconi Co. when Admiral W. H. G. Bullard and Commander Hooper, U. S. N. suddenly projected themselves into the situation. The Admiral made a vigorous plea to Mr. Owen Young of the General Electric not to sell to the Marconi Company, for both the British and the American Marconi companies were British controlled. The Admiral argued hard for American control. Mr. Young pointed out that the General Electric Company had no market for these machines but the Marconi Co. That did not disturb the Admiral. His answer was to suggest an American company with Government backing, and he tried to get the Government to back a company to keep the American flag in the ether. In this he failed, but he did finally persuade the General Electric Company to see if an American company could not be started without Government help, to keep the United States from having all its overseas radio in foreign hands. How this was finally worked out is another story—and a very dramatic one to be told later. The result was the formation of the Radio Corporation of America. The Radio Corporation bought out the American Marconi Co. It has now under the American flag the biggest commercial radio business in the world. It is controlled by the General Electric Co. and the American Telephone & Telegraph Co. In its formation these companies granted to the Radio Company the right to sell the radio products of the General Electric Co. and the Western Electric Co. which are the manufacturing subsidiaries of the Telephone Company. They also agreed that the Radio Company was to hold the radio patents of both concerns and that both were free to use any of the patents in manufacture. After this was done, the Westinghouse Co., rather than deal with foreign radio competitors or set up a rival concern, likewise pooled its patents and agreed to sell through the Radio Corporation. In this way the maximum American strength was com-

bined to meet foreign competition in the commercial radio field.

Then, suddenly, broadcasting aroused the demand for receiving sets. The Radio Corporation formed for entirely different purposes found itself besieged with a demand. It has put forward its utmost energy to get equipment from all its manufacturing connections and the fact that the patents of the American Telephone & Telegraph Co., the Western Electric Co., the General Electric Co., and the Westinghouse were all pooled has greatly facilitated the supplying of the public demand.

The results of the pooling of the patents of the big electrical companies makes it seem possible that it might be in the public interest if similar coöperation included the whole field and that the patent situation in radio were worked out by coöperation rather than litigation. This would in no wise impair competition in manufacture. There is now keen competition between the manufacturing concerns who sell through the Radio Corporation as well as between the Radio Corporation and all other manufacturers. The position of the American Telephone & Telegraph Company is a little different from that of any of the manufacturing companies. It makes no instruments. It is not interested in broadcasting as a means of selling instruments. Its business is selling communication. If a man wants to talk from the mainland of California to Catalina Island, the telephone company will give him this service by radio. A similar service is being considered across Albemarle Sound, N. C.

Similarly if a man would like to talk to all his neighbors at once and can pay for it, the American Telephone & Telegraph Company will try to equip itself to provide him the service by radio. The company is completing a broadcasting station for the purpose in New York. But it is frankly an experiment. The demands of the public will determine radio's future in this as in all other respects.

The most obvious motive for wishing to talk to all one's neighbors is for the purpose of selling them something. The Conference under Secretary Hoover's chairmanship agreed that it was against public interest to broadcast pure advertising matter. The American Telephone & Telegraph officials agreed with this point of view. Their experiment is to see whether there are people who desire to buy the right to talk to the public and at the same time tell the public something it will like to hear.

If this experiment succeeds, a commercial basis for broadcasting will have been established. If it does not succeed the public will be left with the free broadcasting of the companies that sell equipment, the newspapers, etc. If the selling of equipment keeps on as at present, the companies that sell largely can perhaps continue to bear the expense of broadcasting. But as the present rate of buying shades down and competition becomes keener and closer, it might not be possible for one company or group to bear the expense of broadcasting which is the stimulant for the demand that all manufacturers enjoy.

These problems affect not only the Westinghouse Co., which operates four stations, but the operators of many other broadcasting stations as well. Altogether, according to present available information, there are more than twenty stations which broadcast extensively. The General Electric Company broadcasts at Schenectady; the American Radio and Research Corporation broadcasts from Medford Hillside near Boston; the C. D. Tuska Co. from Hartford, Conn.; the Carter Electric Co. from

Atlanta, Ga.; the Precision Equipment Company from Cincinnati, Ohio; the Western Radio Company from Kansas City, Mo.; the Reynolds Radio Co. from Denver, Col. The state universities at Madison, Wis., Austin, Texas, and at Lincoln, Neb., also broadcast, and on the Pacific Coast a number of commercial houses pay the costs of a broadcasting station for the advertising they receive, although the advertising consists of little more than the mention of their names. In Seattle, Wash., a newspaper, the *Post-Intelligencer*, also maintains a service, as does the Detroit, Mich., *News*. There are short range stations in many other cities and no doubt the number is constantly increasing.

All these stations give entertainment to which the public listens free of charge. The artists give the entertainment and the concerns that pay for the broadcasting get some incidental advertising. All manufacturers naturally share in the benefits of the sales which such broadcasting stimulates.

Although the Radio Corporation group is made up of the largest electrical companies, it has nothing like a control in the supply of radio equipment. The loud speaker is manufactured under various trade names by such concerns as the Magnavox Co., of San Francisco; John Firth & Co., and the American Pattern, Foundry and Machine Co., of New York; Riley-Klotz Mfg. Co., Newark, N. J. Head sets are produced by such concerns as C. Brandes, Inc., New York; Nathaniel Baldwin, Salt Lake City, Utah; William J. Murdock Co., Boston; Stromberg-Carlson, Rochester, N. Y. The Atlantic-Pacific Radio Supplies Co., of San Francisco, is widely known as a maker of tubes.

Under these conditions what is to be the future of radio as a business? Is it to reach its maximum and become a convenient necessity, a common object in nearly every household; or is it to be far less prevalent? The answer lies fundamentally in the character of service performed by the broadcasting stations, and in the refinement of the receiving instruments. Technically neither the sending machinery nor the receiving machinery is as good as it should and will be, and the science of preparing broadcasting programmes is in its infancy.

The basis on which broadcasting will ultimately be paid for is undetermined, and it is not even clear yet who will eventually do the broadcasting, or what will be broadcasted. After the novelty of listening to words and music in the air wears off, the public will listen not for the sake of listening but for what it hears. If what it hears is of compelling interest or importance, the public will listen. If not it will do something else. If listening is to become a national custom, broadcasting must become a high art and some permanent and ample means provided to support this art.

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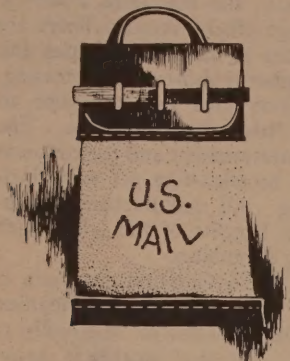
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LETTERS



Dear Jim:

I just realized I had better be getting my check to you for 2 more years of THE HORN SPEAKER. I sure don't want to miss any, as I have every copy from January 1972 up to now and I am a collector, you know.

Jim, maybe you or some of your readers can supply me with a bit of information, in addition to what I already know, concerning an old radio I acquired 7 or 8 years ago. It is a Zenith 1R, a 1 tube regenerative set in a cabinet about 21 inches long and 10" high with a sloping front panel. There is a 2 tube amplifier with it, a Zenith 2M in a matching cabinet 9 1/2" wide. The word Zenith, appears on the top of each cabinet in gold. I have never been able to find any information on these units in any of the old service manuals I have, and I have never seen the 1R on the 2M amplifier mentioned in any publication. I frequently see referral to the 3R and 4R and sometimes see these at old radio meets, but never the one I have. I can't believe I have the only one in existence and would like to hear from anyone else that has one. The man I got it from wrote the Zenith Radio Corporation a letter in April 1972 and I have this letter. It says, in part; "You have turned up one of the very earliest of Zenith radios that we have on record. The 1R is a two circuit receiver. It was manufactured under the name "Zenith" by The Chicago Radio Laboratory and licensed under the Armstrong patent. The 2M amplifier was manufactured in 1922. It was a 2 stage accessory unit to be used with the 1R to operate a loud speaker or headphones. The units were similar to the ones that were built for the McMillan-McDonald Arctic expedition."

The above quote was all that they said about the set. They ended their letter with the following, which still gives me and my collector friends a laugh whenever we read it:-

"We would be interested in the set for our collection as a donation. Should you choose to do this, as a token of our appreciation, we are prepared to offer you a new Zenith radio of current manufacturer."

Fortunately for me, the previous owner did not take them up on their offer.

Got a good buy recently at an auction. I got 7 Official Radio Service Manuals and an original Atwater Kent Service Manual containing all of their early battery sets and several of their early electrics. Got the whole lot for \$22.00.

Also in the same sale, a friend and I went together and bought a box of old magazines for \$70.00 which we split (\$35.00 each). There were well over 100 RADIO NEWS and about the same number of SCIENCE & INVENTION, all in fine condition, all dating from 1924 to 1935.

Enclosed find my check, I will probably keep on subscribing until you quit publishing or I breath my last. I'll take you up on those free adds one of these days. I was in the radio & television sales & service business here, opening my first store in 1937 & retiring in 1980. I still own the building I used, and a fellow that worked for me 27 years still runs it. I have stored in the store basement, lots of goodies that other collectors would like to have so will probably advertize some of them before too long.

Excuse such a long letter & my mistakes, (I'm getting sleepy) and keep up the good work.

Lionel Haid

Dear Jim,

I just received a letter from a crystal set collector from Austria. He has at present 130 different types of crystal sets in his collection. He has a desire to have more contacts with American

collectors..... Erwin Macho, Ambrosweg 1717/A/8, A-1230 Wien, Vienna, Austria.

He also gave me the name of a man from New Zealand that he considers a "specialist" in crystal

sets.... D. A. Laing, 85 High Street, Eketahuna, Wairarara, North Island, New Zealand.

Thanks.

Yours,
Ken Ladd

Dear Jim:

One of my hobbies is research of old articles, etc. I thought I would pass some along to you. A larger library should be able to get copies for you if you find one of interest.

Yours,
Ken Ladd

Making and using a Wireless Telegraph Tuning Device

AF Collins

SCI AM (S) 63:26016

F 16, 1907

Pooles

Silicon Detector and Mesurments of Electric Wave Energy

W Mover Jr.

SCI AM (S) 63:26239

May 25, 1907 Pg 2446

How to Construct an Efficeint Wireless Telegraph Apparatus at a small Cost

A.F. Collins

Scientific American 85:170-1

Sep 14, 1901

Two Homemade Wireless Telegraph Receivers

Scientific American 90:347

April 30, 1904

Acetylene Wireless Telephone Apparatus

Scientific American 90:347

April 26, 1902

The Atwater Kent Hour

Story of J. M. Chapple

National Magazine 60:155-6

July-Aug 1932

AMSI 1932 Pg 293

Radio Books for the General Library

D.A. Hooker

Bulletin of the American

Library Association 29:585-6

Sep 1935

AMSI 1935 Pg 241

Receiving Set, An interesting Review of Reviews 80:490-91

June 1930

AMSI 1930 Pg 310

Building your Wireless Set; The importance of Accuracy

W.R.H. Thingle

Worlds Work 41:614-15

May 1923

Int Index to der lit

1920-1923 Pg 1129

How to Make a Radio receiving set

F.I. Solar

Normal Instruction and Primary Plans 32:31

Feb 1923

Int index to per lit

1920-23 pg 1130

Trees as Receivers
W.A. Mountstephen
Worlds Work (London) 6:279-82
Aug 1905
Mag subject index 1907 Pg 272

Simple Wireless Telegraph Electic
FJ Kenedy
SCI AM 98:170 Mr 7, 1908

Tantulun Detector
SCI AM 100:375-6
My 15, 1909
Pooles Vol 2 1905-1909 Pg 2446

Carboundun and Silicon
Detectors for Wireless Telegraph
AF Collins
SCI AM 96:234 Mr 16, 1907
Pooles Vol 2 1905-1909 Pg 2445

Construction of a Magnetic Detector
EG Gage
SCI AM 96:290-1
AP 6, 1907

Electrolytic Wireless Reciever
DC Beardsley
SCI AM 94:583
Ju 30, 1906
Poole Vol 2 1905-1909 Pg 2445



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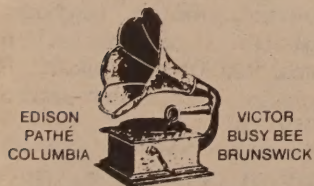
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SET OF BACK ISSUES OF THE HORN SPEAKER, HERBERT F. DEGARD, 203 3RD STREET, EARLY, IA 50535.

1938 CAPITOL RADIO ENGINEERING COURSE COMPLETE IN 8 BINDERS PLUS 19 ISSUES OF CREI NEWS BULLETINS. 1943-50 ALL MINT CONDITION \$225 U.S. VIA UPS PREPAID, JACK, (604) 522-2418, 6758 BRYANT ST., BURNABY, B.C. V5E 1S8 CANADA

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THIS SERVICE MANUAL supplement contains a list of electrical values, resistors and condensers, coils and transformers in all Atwater Kent radios 1924-1933 inclusive \$3.50 P.P. 24 pages. ***** THIS BULLETIN contains the complete list of Philco black bakelite "by pass" condensers, new universal types, discontinued types with replacements and condensers with internal resistors \$1.50 P.P. — Lee Williams, 2015B 228TH S.E. Bothell, WA 98021.

FOR SALE— RIDERS MANUALS, ABRIDGED (VOL. 1-5) AND VOL. 6 THROUGH 16 \$275.00. VOL. 9, 10, 14 \$20.00 EACH. ANTIQUE RADIO SERVICE, O. H. McDONALD, 2535 WEDGELEA #124, DALLAS, TX 75211.

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ELECTRONIC ORGAN SCHEMATICS AND MANUALS. SASE FOR PRICE QUOTES. MANY MAKES AND MODELS. ALTON H. BOWMAN, 4172 EAST AVENUE, RD 2, CANANDAIGUA, NY 14424.

FREE INFORMATION ON ANTIQUE RADIOS, Robert Johnson, 1895 Curtner, Apt. #2, San Jose, CA 95124.

FOR SALE — GENERAL

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FOR SALE: HOME RECEIVERS; COMMUNICATION RECEIVERS; TUBES; LITERATURE, BOOKS, SCHEMATICS; COMPONENTS and sundry parts; postcards; original tube data from N.O.S. tube cartons; collectors' tubes; barrehers; voltage regulation and ballast "tubes." vibrators; and other related miscellaneous. Write for requirements. All inquiries answered. L.S.A.S.E. plus \$2.00 for lists. Derm Whelan, 31 Middleton Street, St. John's, NFLD., Canada A1A 3J2.

NEED ROOM! Eico ST40, plays good, \$40; Fischer 500, no case, plays \$23; Fischer 600, plays, missing rubber feet \$30; Heathkit stereo, preamp, missing cover \$14; Eico stereo preamp \$20; Stromberg-Carlson tuner, blonde leather type case \$15; Eico HF32 mono integrated amp \$15; Leak Point One stereo preamp no top cover, no power supply \$25; Webster PA amp type 85-25, pink case \$7; NTS Electronics course, early 1970's; app. 55, 30 page booklets, complete? don't know, \$5; Channel Master int. amp, model 6601, slightly rough shape, \$10; early quackery device, missing one wood side, rough shape, \$60; Eico stereo record playback preamplifier, model KP70, no case \$20; Emerson chassis, 7 tubes, 4 controls, no model \$15; Seco VT grid circuit tester model model GCT-5, been repainted \$5; Motorola tube car radio, model 350 \$3; TRADE ITEM !! Seeburg RSI-8 small teardrop speaker, call for info. WANTED!! Part where three tubes sit on for AK model 10c "breadboard." All items sold in "as removed from shop condition. No guarantees — AS-IS. UPS extra. Jerry and Debbie Schliepp, 831 Berlin Road, Ripon, WI 54971. (414) 748-2471.

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FOR SALE: 100's OF RADIOS, speakers, magazines. Send \$1.50 (stamps OK) for current list to Jim Clark Enterprises, Dept. THS, 1292 Starboard, Okemos, MI 48864.

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FOR SALE: I HAVE SOLD MY RADIOS. All who have requested my list will get a revised list. I have a few battery radios and speakers. I have many amateur radios, tubes and magazines; also teletype equipment. military surplus; some nice test equipment. Amateur handbooks and magazines. I have to sell before March. Russ Olmsted, K4UJZ, 608 W. Thompson Lane, Murfreesboro, TN 37129. (615) 893-5344.

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TUBES, SCHEMATICS, LITERATURE, ETC. for early electric radios. SASE for free price list. Sam Faust, Changewater, NJ 07831-0094.

2 PHILCO CATH. 70 — 1 PHILCO TOMBSTONE, 37-89 — 1 PHILCO TOMBSTONE 60-B — 1 AK MODEL 55 RED COVER AND SPEAKER. RUSSELL OR IRMA SCHOEN, E7340 NIETZKE ROAD, CLINTONVILLE, WI 54929. (715) 823-6744.

MAJESTIC, model 25, ser.# 2B036224 Grigsby Grunow Co., radio on tall legs — Western Auto Supply Company, model 929-48380, 50-60 cycle, 83 watts— console model— needs veneer work, lights up but doesn't play. has plug in for TV. G.E. tubes in chassis #001048. make offer. S. T. Mellas, Rt. 1 Box 119F, McNeal, AZ 85617.

LARGE MAHOGANY WALL TYPE TELEPHONE with shelf, magneto and bells. 30" high X 10" wide. Two carbon button mikes.. one double button and one single WESTERN ELECTRIC. Some blue Amberol cylinder records. Aeriola Senior radio, some plastics. R. Matson, RFD#1, Box 2943, Kennebunk, ME 04043. (207) 985-3751.

PHILCO CATHEDRAL MODEL 70, EXCELLENT, 01A TUBES, NEUTROWOUND BATTERY SET WITH SPEAKER, 2 OLD TELEPHONES. RUSSELL SCHOEN, E 7340 NIETZKE ROAD, CLINTONVILLE, WI 54929, (715) 823-6744.

RME 69 EARLY RECEIVER. rack mount, generally good, weak on 160 meter band \$95; loose coupler, unusual replica \$35; crystal grinding outfit \$15; very early RCA/GE/Acme transmitter power supply transformer and choke (for Vu-202 & such) iron case \$45; Polaroids \$1.00@. All plus UPS. Paul C. Crum, W9LC, 6272 N. Cicero Avenue, Chicago, IL 60646. (312) 282-3033.

FOR SALE: ANTIQUE (1924 VINTAGE) ATWATER KENT BREADBOARD MODEL 10A IN ALMOST MINT CONDITION, WITH FIVE GOOD UX201A'S INCLUDING MODEL M HORN SPEAKER. WARRANTY AND INSPECTION TAGS ARE OK. \$700.00 PLUS SHIPPING AND PACKING. PREFER NOT TO SHIP. WILL CONSIDER SELLING SET OR SPEAKER SEPARATELY. LEO GIBBS, WBBHT, 701 BROOKFIELD ROAD, KETTERING OH 45429. (513) 299-3965.

SERVICE MANUALS RIDERS, HOWARD SAMS, RCA, PHILCO AND OTHERS. TUBE TESTERS, SIGNAL GEN'S. NEW AND USED TUBES, SERVICE PARTS, NEW N.O.S. VOLUME CONTROLS. DIAL BELTS. DIAL BULBS AND MORE. 1,000'S OF UNLISTED PARTS. WRITE WANTS AND SASE. NEW LIST SASE. JAMES BIDDLE FOOT CANDLES LIGHT METER \$25.00. WESTINGHOUSE FOOT CANDLE LIGHT METER BAKELITE CASE \$20.00. RADIO PANELS SIZE 24" X 7" \$18.00, 26" X 7" \$19.00, 18" X 8" \$18.00. SMALL

REPO (PLASTIC CASE) AM-FM (NEW) CATHEDRAL RADIO 8" HIGH \$14.00. ALL PLUS SHIPPING AND HANDLING. SERVICE SINCE 1930. KRANTZ, 100 OSAGE AVENUE, SOMERDALE, NJ 08083.

STEWART WARNER model 305, Stewart Warner speaker, American Bosch model 360, Silvertone model 1386, Clarion Jr. 320 superhetrodyne, small mirror tone deluxe, ivory colored radio with red knobs, case only for a Kennedy cathedral. Send for new list. Clifford Schoen, 549 Fulton St., Seymour, WI 54165. Phone (414) 833-2429.

FOR SALE: RADIOLA MODEL II 225.00, 11 pr. Newcomb headsets 2.00 pr., Junker Magnavox TRF model D 15.00, 1930's Zenith junker tombstone 10.00, model 3970 Philco battery tombstone 15.00, UZ-1325 horn only 10.00, table model 1950's Admiral electric radio with phonograph 10.00, model 10728A Philco Transitone 10.00, late 20's American Bosch electric set with 8 tubes 50.00, 1950's Studebaker car radio 20.00, 1940's Zenith push button electric radio (plays) 25.00, U.P.S. extra, Larry Chambers, 5026 Suter Drive, Nashville, TN 37211, AC (615) 833-2448.

FREE: Send 2-stamp LSASE for just released Flyer, No. 189 to: Olde Tyme Radio Company, 2445 Lyttons-ville Road, Silver Spring, MD 20910.

MANY THOUSANDS OF OLD TUBES. LARGE 80, 81, 82, 83 BOXES OF WESTERN ELECTRICS RECEIVING AND TRANSMITTING TUBES, PEANUT TUBES, METAL TUBES, E. H. SCOTT TUBES, BOXES OF LOCTALS AND OCTALS. IV TUBES. ALSO FIRST EDITION RIDERS SUBSTITUTION GUIDE BOOK. ONLY SELLING ALL U PICK UP. TUNGAR BULBS. TO: BASIL ABBOTT, #4 BUNKER HILL, RICHARDSON, TX 75080.

FOR SALE: to receive America's best list of radios, tvs, mags, etc.. send \$1.50 for current list to: Jim Clark Enterprises, Dept., HS, 1292 Starboard, Okemos, MI 48864.

SEND LARGE SASE for list of radios., Donald Juleen, 6252 Ledge Road, Sturgeon Bay, WI 54235.

FOR SALE — PHILCO

PHILCO 95TH ANNIVERSARY limited edition cathedral radio, AM/FM transistor chassis, look a like to Philco model 90 — 1932— collector's item, only \$59.95 plus \$5.00 shipping. Maurer TV, 29 South 4th Street, Lebanon, PA 17042.

FOR SALE — SCOTT

SCOTT ALLWAVE 12 IN NAPIER CONSOLE CABINET, GOOD UNRESTORED CONDITION, CABINET NEEDS MINOR VENEER REPAIR, TUBE COVERS AND COIL CANS NEED RECHROMED. TRADE FOR BEST OFFER OF 1940'S JUKEBOXES AND/OR PRE 1941 SLOT MACHINES. ALVIN HECKARD, RD1, BOX 88, LEWISTOWN, PA 17044.

FOR SALE — SPLITDORF

SPLITDORF JC S 102 308 radio in an Adler Royal cabinet, 44" high 38" wide, walnut with two large doors in front, extra set of tubes \$200.00. (201) 228-0435. J. Baerenrodt, 5 Pine Road, Roseland, NJ 07068.

FOR SALE — TUBES, PARTS, ETC.

FOR SALE — 500 NEW GE IN BOXES— TUBES— ALSO HAVE TRANSMITTING TUBE LIST. SEND SASE FOR 6 PAGE LIST. RUSS OLIVSTED, K4UJZ, 608 W. THOMPSON LANE, MURFREESBORO, TN 37129 (615) 893-5344.

FOR SALE: UNUSED AND USED TUBES, cone speakers, electrolytic capacitors, send SASE for lists. C. Elmer Nelson, 11 S. Church Street, Princeton, IL 61355.

30 DAY SALE: New tubes in original cartons \$2.00 each. 0Z4, 1AD2, 1BC2, 1R5, 2AV2, 3HQ5, 3Q4, 3S4, 4BZ6, 4BZ7, 5AV8, 5U8, 6AH4, 6AL5, 6AY4, 6AY8, 6AQ6, 6AS8, 6AW8, 6AY3, 6BC7, 6BF6, 6BJ8, 6BK5, 6BW8, 6C47, 6CN7, 6CS7, 6CU5, 6CUB, 6CY7, 6DB5, 6DK6, 6E45, 6FS5, 6GC5, 6HZ6, 6KZ8, 6U8, 6W6, 7AD7, 8AW8, 8CX8, 10EG7, 12A4, 12AB5, 12AL5, 12AT6, 12AT7, 12AV5, 12AV6, 12AZ7, 12C5/12CU5, 12D4, 12DB5, 12DT5, 12KS, 13DE7, 14E6, 14E7, 19AU4, 19J6, 3535, 35W4, 35Z3, 50EH5, 5963, 5964. Add \$2.40 shipping (Wisconsinites add 5%) Don Diers, 4276-S4 North 50th Street, Milwaukee, WI 53216-1313. Send \$1.00 (refundable) for lists of tubes and stuff.

FOR SALE: GRILL CLOTH. New, custom-made material in diamond pattern. Good match for 1930's radios. \$6.00 for 10" X 12" piece, postpaid. Send SASE for sample. Michael Katz, 200 East 30th Street, Apt. 8E, New York, NY 10016. (212) 725-0736.

TUBES ONE-V 6.00, 6V5/6G5-6E5 12.00, 6L6M 17.00, 6L6 GC 10.00, 6 and 12 V 3 and 4 prong vibrators 12.50 all ppd. H. f. Brammell, 204

E. Maple, Americus, KS 66835.

FOR SALE: NEW IN ORIGINAL BOX, 215-A WESTINGHOUSE \$30.00. ONE BRASSBASE UV-201-A TUBE EX. CONDITION POST PAID. \$20.00 NO TIP USED. CLEON BOOTHE, BOX 235, COHOCTON, NY 14826.

TELEVISIONS

RCA CT-100 FIRST PRODUCTION COLOR TV set — beautifully restored cabinet and meticulously restored electronics with a great 15" color picture like 34 years ago (1954). An opportunity is now to own a unique electronic invention of the century. SASE and \$1.00 for photo. Bill Russell, 3236 Laurel Canyon, Santa Barbara, CA 93105. (805) 682-8115. Accepting offers through March 1988 (min. bid \$2,500 or \$3,500 sold outright.)

RCA TV Model 8PT7010 in red metal case in working condition. Included second set same model for parts. Make offer. John Schellkopf, 1344 Goucher Street, Pacific Palisades, CA 90272.

FOR SALE — ZENITH

THE CABINET IS IN MINT CONDITION and the radio plays. It is a Zenith 12 tube superhetrodyne with a tuning range 540-18400 kyc., chassis 1204-A. Marshall T. Bond, 8718 Linkfair lane, Houston, TX 77025. (713) 668-0029.

FOR SALE: 1940'S VINTAGE ZENITH CONSOLE radio and phonograph. Cabinet is in excellent condition. \$250.00 — Call (815) 838-5398. 5 p.m. to 10 p.m. c.s.t. Dick Stauss, Rt. 1 Box 399, Lockport, IL 60441.

WANTED — BRUNSWICK

ONE PUSH BUTTON for a Brunswick radio. Chassis M-27-6 serial # 1237. It is brown bakelite, 7/16" in. diameter, 1" long. George C. Edwards, Route 3, Box 956, Henderson, NC 27536.

WANTED — CRYSTAL SETS

HOMEBREW CRYSTAL SET. Dial type mounted on nice wooden cabinet. Vernon Kostohryz, 600 Lakeside 3A, Brownsville, TX 78520. (512) 541-5692.

WANTED — EDISON

WANTED FOR EDISON STANDARD phono—model B. 1.) mainspring 2.) decals—trademark and "Edison, 3.) cabinet lid 4.) A. K. breadboard in excellent condition. Carl Hickey, 27404 N. Highway 1, Fort Bragg, CA 95437. (707) 964-0505.

WANTED — GENERAL

FRONT DOOR of AK Kiel table. Also want 16mm sound print of 3 stooges, "A Plumbing We Will Go." Jim Baker, 704 Medway Road, Hagerstown, MD 21740-4130.

WANTED — DIAL AND SPEAKER FOR KENNEDY MODEL 63 OR SIMILAR MODEL. AUDIO TRANSFORMER FOR GREBE ROK-LOOKING FOR FACTORY CRYSTAL SETS, EXCEPT PHILMORE. RAY SCHOBBER, 4503 WEST DRIVE, NORTH LITTLE ROCK, AR 72118. (501) 771-1480.

CRYSTAL SET B & W PHOTOS of manufactured units for book on Crystal Set Era, Variometers, Varicouplers, Crystal Detector Stands, Headphones, Variable condensers, etc. Will pay for photos of manufactured crystal set units and will purchase all parts. Literature and books also wanted. B. Turke, 660 N. Dixie Highway, Hollywood, FL 33020.

WANTED: COLLINS TRANSMITTERS 4A, 32A, 32B, 45A, 150B and 300B and any other pre war II amateur radio equipment. Top prices paid by Collector Parker, W1YG, 87 Cove Road, Lyme, CT 06371. (203) 434-7783 or (813) 262-2568.

SET OF 7 BAND CHANGING PUSHBUTTONS for Zenith Trans-Oceanic (slide rule type dial), manuals or copies for: Waterman 517A pocket scope, Electro-logic V1 (spinning drum type) Digital voltmeter. Peter J. Ben, 222 Parkview Terr., Lincroft, NJ 07738.

GOOD DIALS FOR PHILCO 37-62 (p/n 27-5287), Emerson 565 AM/FM, & Sonora RCU-208; Good cabinet GE A-65, Rider Vols. 20, 21, 23; Richard Brown, 117 Meisel Avenue, Springfield, NJ 07081. (201) 467-9628.

BATTERY TYPE "RADIOLA" that fits into the Brunswick model BR100 radio phonograph unit. Also, any info or literature on same. Dick Roznovsky, Box 480, Richfield, OH 44286.

WANTED. Oscilloscopes of the 30's. Not working ok if complete, inside & out. Also want 1" to 3" CRT's for early scopes. Have many radios,

TVs, parts & literature to swap or will buy. John Kendall, P.O. Box 436, Fallston, MD, 21047.

OLD FIDDLES/ VIOLINS, BANJOS OR MANDOLINS, ETC. ANY CONDITION IF REASONABLE PRICE. THE OLDER THE BETTER. ALSO DO REPAIRS ON FIDDLES/ VIOLINS. CALL OR WRITE JAMES BARNES, 7812 TAZEWELL PIKE, CORYTON, TN 37721.

OLD BROADCAST OPERATOR IN ARIZONA INTERESTED IN OLD RADIO MEMORABILIA; PAPERS, OLD TUBES, NOVELTIES, SMALL RADIOS, AND COMPONENTS OF THE TWENTIES AND THIRTIES. HAVE RADIOLA 25 WITH LOOP, 6A40 ZENITH WAVEMAGNET, PHILCO 32V FARM RADIO, R.C.A. NAVY SHIP RECEIVER, EICO 950 RC BRIDGE, GERMAN RADIOS, WILCOX GAY TAPE AND RECORD PLAYER, BC 348 RECEIVER, SYLVANIA METAL TUBE CABINET, SYLVANIA JACKET, TUBES, CHOKES, METERS, TRANSMITTER COLLINS 32V3, EICO 720, W.E. INTERCOM AND A FEW W.E. TUBES, GONSET COMMUNICATOR IV, GRAY AUDIOGRAPH, STENTYPE MACHINE AND QUACK MEDICAL MACHINES. LIKE TO HEAR FROM COLLECTORS... WAYNE FERNYHOUGH, 1632 W. ROVEY AVENUE, PHOENIX, AZ 85015.

GLASS TUNING DIAL FOR MOTOROLA 5T, ZENITH TOMBSTONE, (AKA WALTON'S RADIO), PHILCO 16B, 90, 70 AND ANY OTHER CATHEDRALS OR TOMBSTONES. MIKE BUKOWSKI, 926 CROWNRIDGE DRIVE, COLORADO SPRINGS, CO 80904

WANTED. BROWN BAKELITE KNOB and 199 tube socket from Steinite model 990 series radios. Ed Clerkin, 1305 San Marcos Ct., San Luis Obispo, CA 93401. (805) 544-3088.

WANTED: A WIRE RECORDER for playing 3 3/4" spools of recording wire. Used navy equipment. Russell Starkey, 855 Eisenhower Avenue, Jasper, IN 47546. Phone (812) 482-1016.

SIDE TUNING KNOB FOR BELMONT 6D111, manual and schematic for measurements model 80 and Heathkit LG-1 signal generators, RIDERS vols. 16-23, and SAMS 1-700. Looking for a book by the title of "Case Histories of Receiver Troubles and their Remedies," published by Rinehart Books in addition to a hard-cover copy of Tyne's "The Saga of the Vacuum Tube." Am also interested in contacting other collectors in Columbus, Ohio area. Brett Gundlach, 276 E. COMD AVE., COLUMBUS, OHIO 43202, HOME 614) 267-0346, WORK (614) 888-9502.

RADIOLA 28 with 104 speaker, Radiola 25, Radiola 20, Norden Hauck Superhet, Leutz Superhet, Pilot

Super Wasp, Pilot parts, Crosley parts, Atwater Kent parts and AK breadboard parts, RCA UZ-1320 horn, Radiola RS, Zenith Super VII or VIII, crystal sets, Burns horn, Emmett A. Smith, 2714 Alden Road, Baltimore, MD 21234.

WANTED— CABINETS FOR RADIOLA X, AND FEDERAL 59, DISPLAY SODION TUBE, UNUSUAL HAND KEYS, INFORMATION ON HALLECK-WATSON COMPANY OF PORTLAND, OREGON. PAT STEWART, W7GVC, 1404 RUTH AVE., WALLA WALLA, WA 99362.

WANTED: ZENITH 11 OR 12 BAND "TRANS-OCEANIC" TRANSISTOR, TOSHIBA "GLOBE-TROTTER," SONY "ORBITER" RECEIVERS OR PARTS, ALSO KLH-21 FM ONLY RADIO. BILL WADE, 657 14TH AVENUE, PROSPECT PARK, PA 19076.

WANTED: ENTIRE WORKS for Capehart 500K, also Edison C-1, C-2, Balmoral and Alva, Victor 10-51A, Tom Grattelo, 2818 Central, Alameda, CA 94501.

PEERLESS MODEL 194R-60 9" DYNAMIC speaker with cabinet in good working condition. H-P model 410C VTVM working. RCA Victor R-35 radio in excellent working condition. Simpson model 1699 milliohm meter in working condition. Radiola 20 chassis with good audios. Audio transformer for RCA Victor R15 or RCA Radiola 48. Radio Broadcast magazines for 1922 and 1928. Early Canadian Radio magazines such as Canadian Wireless, Radio, etc. Radio News for July, August and October 1919. October 1921, January 1922, August and September 1924. Top prices for good condition magazines. R. A. McNeill, P. O. Box 472, Yorkton, Sask., Canada S3N 2W4 (306) 783-6121.

WANTED: DECANter BOTTLES, ice bucket, shot and drinking glasses for model 9008-B Porto-Baradio made by Stewart Warner. Clarence McGinnis, 1507 N. Glenn Street, Morristown, TN 37814.

WANTED: WWII MILITARY Iconoscope TV camera or tube alone. OK if converted to amateur use. Canadian Marconiphone III regen., IV neutragenaflex, VI, VIIA, VIII, IX, XI. Canadian Westinghouse model W55, W55A, W60A, W57. Hammarlund Trans-Oceanic "Two", De Luxe, Hawk. Kresge Z4 Commander, Karas Short Wave Receiver. D'Arcy Brownrigg, P.O. Box 292, Chelsea, Quebec, J0X 1N0, Canada.

WANTED: A. K. MODEL 55, need everything to mate with gear on tuning condenser. Could also use but not so critical speaker or cone

for above. Floor cabinet model, need ivory knob, prefer function for FADA mdl. 790. Will buy junk A.K. if it has at least the tuning parts. C. England, 98 Montague, So. Zanesville, OH 43701.

C-4 TUBE. for Columbia radio model C-80A. SPRING AND PLATE for A.K. speaker model M. Russ Schoen, E 7340 Nietkze Road, Clintonville, WI 54929. (715) 823-6744.

I BUY BATTERY RADIOS and horns from the 20's, if you have one to sell, send me a card with name, model and price. Rick Parrish, 1260 Marilyn Drive, Cape Gir., MO 63701.

WANTED: ZENITH OCEANIC 7000, TOSHIBA-GLOBAL, GRUNDIG SATELLITE OR SONY "ORBITER" BATTERY MULTIBAND SET, WADE, 657 14TH AVENUE, PROSPECT PARK, PA 19076.

WANTED: ONE VERY NICE RADIOLA 100 A LOUD SPEAKER, PLEASE WRITE: PAUL O'PATIK, 316 RUTHERFORD AVENUE, FRANKLIN, NJ 07416.

DO YOU HAVE THAT CLASSICAL 78 ALBUM that has a damaged or missing record? I have an "album singles for sale" listing that I will send to anyone for a 25 cent long self-addressed stamped envelope. Anton Johannes, R.D. #3 Box 253, Pine Bush, NY 12566.

WANTED. I BUY RADIO TV collections. Please send description and price desired. John Kendall, P. O. Box 436, Fallston, MD 21047.

WANTED— SCHEMATIC, ETC. ON BLUE RIBBON AND REMINGTON 5 TUBE RADIOS, OR OTHER RADIOS LIKE THE ABOVE. WANT TO GET THEM WORKING WITH ORIGINAL PARTS. W. G. WEAMER, 390 E. FOSTER ROAD, SANTA MARIA, CA 93455.

WANTED "TENSOR ANALYSIS OF NETWORKS" by Kron; Briggs and Stratton crystal set; accessories for "smokerette" radio. Forrest Baker, 1558 W. Garfield, Davenport, IA 52804.

WANTED — HEADPHONES

NONWORKING OR WORKING HEADPHONES: Advance, Ajax, Allied, Aristocrat, BASCO, Bel-Canto, Benwood-Linze, Berkey, Berstan, Big Three, Blue Streak, Brandes (early model that has "Superior" stamped on wide nicked band), Branston, Brown, Churry, Clarion, Davis (bakelite), DTW, DECO, Dymac, Eastern, Eisman, Electro Importing, Essex, Ericson, Everytone, Excello, Federal 52-W, Friedlander-Koppler, Gold Stripe,

Gold Tone, Gundlach- Manhattan, Hart- Hegeman, Hartford, Harvey- Wells, Haynes- Griffin, Huball, International, Interocean, IWB, Jolley, Keystone, Kilbourne Clark, Kodak, Lark, Litewate, Magnus, Metro, Mackay, Majestic, Miller, More Tone, Murdock Special, Music Master, National, Navy Ordance Supply, Ohio, Orator, Penn Headset, Perfectone, Ports, Rasco, Radiocraft, Radiotive, Randolph, Red Head, Royal, Seco, Sears, Spartan, Smelzer, Splitdorf, Sraco, Steimetz, Sunlight, TBM, Teleradio, Tempest, Trego, Victor, Welbilt, White Beauty, Wireless Specialty, Ben Wolfe. Vernon Kostohryz, 600 Lakeside 3A, Brownsville, TX 78520. (512) 541-5692.

WANTED — LEUTZ

WANTED FOR LEUTZ MODEL "C" superhet.: 2 Weston No. 301 voltmeter 0 - 10 volts DC. 2 Weston no. 301 ammeter 0-5 amps. DC. 4 General Radio type 231 A audio transformer. 6 special Leutz I.F. transformers. 1 special E.I.S. (Leutz) oscillator coil. 1 special E.I.S. (Leutz) R.F. coupler coil. John A. Rawlins, Jr., 1920 Stephenson Drive, Mesquite, TX 75149. (214) 285-2313.

WANTED — LITERATURE

SERVICE MANUAL FOR NATIONAL NC-7" TV RECEIVERS. FRED EMERSON, 627 ILLINOIS AVENUE, ELGIN, IL 60120.

SCHEMATIC FISHER AMP. STEREO MODEL 400 SERIAL 34732 S. ALL TUBE AND HAS FOUR 7868 IN OUTPUT. J. MC DADE, 204 E. JOPPA ROAD, # 214, TOWSON, MD 21204.

SAM'S FOLDERS No's. - 55-5, 60-1, 61-16, 80-4, 81-3, 82-1 and 104-2, FRED EMERSON, 627 ILLINOIS AVENUE, ELGIN, IL 60120

INSTRUCTION MANUAL FOR EICO MODEL 950 A RC BRIDGE CONDENSER CHECKER. H. F. BRAMMELL, 24 E. MAPLE, AMERICUS, KS 66835.

EVERY DAY MECHANICS, VOL. I, NO. 4, MAY 1916 OR A COPY OF "HOW TO BUILD A TRANS- ATLANTIC WIRELESS RECEIVING SET. K. A. LADD, 5240 44TH AVE. S., MPLS., MN 55417. (612) 722-6786.

LAFAYETTE RADIO CATALOGS - 1960 THRU 1968, PLEASE STATE CONDITION AND PRICE. MR. MICHAEL S. SABODISH, SR., 11 - A MATAWAN AVENUE, CLIFFWOOD, NEW JERSEY 07721.

WANTED: OPERATING MANUAL and tube

data sheets for Jackson Dynamic tube tester model 636. Zerox copy O.K. Frank Hoffert, 19605 Chardon Road, Cleveland, OH 44117.

WANTED - INFORMATION AND SCHEMATIC for Blaupunkt Sultan 3D radio. Model number unknown, 5 tube AM/FM/ SW. Write Ray Carifio, NALTS, 6014 SW 33rd Street, Miami, FL 33155

WANTED: LIBRARY BOUND volumes of QST, CQ, 73 PRE 1960. ALSO GLOBE SCOUT (WRL), MIKE GRIMES, K5MLG, 3805 APPOMATTOX CIRCLE, PLANO, TX 75023.

WANTED: SCHEMATIC AND INFO on Eico ST 70 amplifier. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada T6H 0H9.

WANTED: INSTRUCTIONS FOR PACO MODEL 25 IN-CIRCUIT CAPACITOR TESTER RCA WR-50A SIGNAL GENERATOR CRYSTALINER (CRYSTAL MODULES) GENERATOR, GLENN HARTMAN, 5545 DEEP HOLLOW, FAYETTEVILLE, NC 28311.

WANTED — PARTS, TUBES, ETC.

CHROME TUBE CAP FOR NEUTROWOUND BATTERY RADIO. RUSSELL SCHOEN, E. 7340 NIETZKE ROAD, CLINTONVILLE, WI 54929. (715) 823-6744.

NATIONAL TYPE PSK PRESELECTOR FOR NATIONAL FB7-A RCVR. SW3, FB7 COILS. NATIONAL VELVET-B POWER SUPPLY. PAT STEWART, W7GVC, 1404 RUTH AVENUE, WALLA WALLA, WA 99362.

TUBE SOCKETS— 3-4-5-6 PRONG COMPOSITE. 2-5-6-7 PRONG COMPOSITE. 1-5-7 PRONG COMPOSITE. 4-7-7 PRONG COMPOSITE. JACK S. WALLACE, 5516 GILBOW AVENUE, RIVER OAKS, TX 76114. (817) 732-5189.

COOPER-HEWITT Mercury vapor bulb. TCBA, RR6, Box 181, Glens Falls, NY 12801

FIXED DETECTOR GRID RESISTANCE FOR ATWATER KENT MODEL 32 AK PART # 8190, ALSO GRID LEAK RESISTOR, AK PART #8190. ALSO FOUND IN MODELS 20c- 30- 33- 35. C. Hoffman, 824 Gordon Street, Allentown, PA 18102. Phone (215) 434-2536.

REPLACEMENT CONE MATERIAL FOR STROMBERG- CARLSON 601-TRF COMPANION CONE SPEAKER. LAWRENCE DE ROSE, 12 WILLS AVENUE, R.D.#1, STANHOPE, NJ 07874.

MACHINES SCREWS TO HOLD PANEL TO CABINET, RADIOLA III AND IIIA, I NEED TWO DOZEN. ERNEST HECKLER, 1314 N. SPARKMAN, HARTSELLE, AL 35640.

WANTED — BATTERY RADIO CHASSIS AND/OR ANY INFORMATION ON BRUNSWICK RADIOLA PHONOGRAPH, MODEL BR100, PATENT 1923 — DICK ROZNOVSKY, BOX 480, RICHFIELD, OH 44286.

WANTED: CABINET & AUDIO TRANSFORMERS FOR GREBE CR9, ARTHUR HARRISON, 501 ARBOR DRIVE, COLUMBIA, MO 65201. (314) 474-8729.

DIAL TUNING KNOB AND RESET LOCK SCREW FOR A WARDS 62501 TABLE MODEL RADIO, RIDER 10 - 22, H. F. BRAMMELL, 24 E. MAPLE, AMERICUS, KS 66835.

ZENITH DETECTOR COIL NO. S-8436 USED IN CH, 10A1, 10A2, 10B1, 10B2. ATWATER KENT MODEL 60 A.F. TRANSFORMER ASSEMBLY. L49B BALLAST TUBE. 45 RPM SPINDLE FOR B5R C129 CHANGER EV/GAME 436. CABINET FOR PILOT TV 37. 3KP4 CRT. ELECTRONICS MEASUREMENT CORPORATION. MODEL 502 SIGNAL GENERATOR, ASSEMBLY MANUAL OR SCHEMATIC. AUDIO INPUT XFMRs FOR SINGLE PLATE TO P-P GRIDS. ANY JUNKBOX PARTS, LITERATURE. ANY EARLY TWO AND THREE PIECE CAR RADIOS, UNITED MOTORS, B.O.P., ETC. ANY OTHER FACTORY CAR RADIOS FROM 30'S - 40'S. ANY SIGNAL SEEKING TYPE CAR RADIOS, MUST HAVE KNOBS. CAR RADIO KNOBS. — ALVIN HECKARD, RD1, BOX 83, LEWISTOWN, PA 17044.

EARLY OR UNUSUAL TUBES, tube cans, cartons also early light bulbs pre 1900. Please describe with prices wanted to: Bruce Harbeck, 13408 Westwood Lane, Omaha, NE 68144. (402) 333-9013.

HALLDORSON 3 to 1 audio transformer, copper casing, hard rubber panel 10 x 11 x 1/4. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada, T6H 0H9.

DETECTOR and AUDIO PORTION of GREBE CR2. Also need cabinet for same. NEED FRONT PANEL FOR SCOTT Phantom DELUXE. Larry Steeno, 2728 42nd Street, Two Rivers, WI 54221. (414) 794-7320.

MARCONIPHONE VIII cabinet, also Marconiphone VI chassis, or complete radios cash, or generous trade. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada, T6H 0H9.

WANTED: EMPTY CABINET for a Philco model 20 cathedral radio. I already have the radio and speaker. Must be in good condition. Joe Beach, 6515 Sunset, Garden City, MI 48135.

WANTED— CABINET AND PARTS FOR A FEDERAL 61. Mike Kibler, 300 Speiter #39, Danville, IL 61832.

(217) 267-3703.

WESTERN ELECTRIC TYPE 216A vacuum tube and VT25 or 25A tubes. The 216A must be check in a circuit. Tod Drogoski, 507 Coal Valley Road, Clairton, PA 15025.

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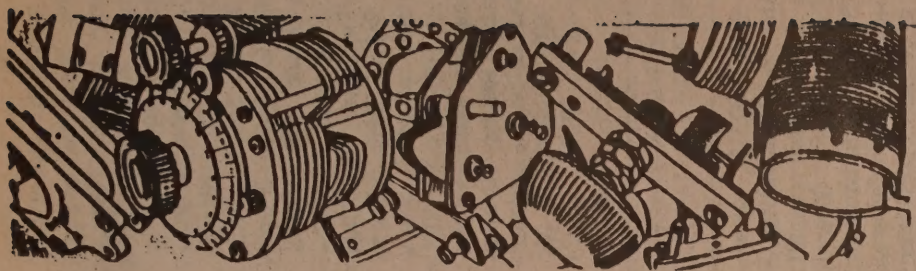
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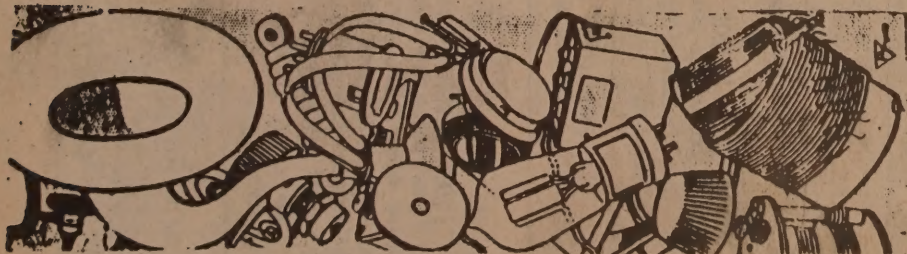
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